Rule WLM111: BTE Phase IDLE sample count is large

Finding: CPExpert has detected that a large percent of the begin_to_end (BTE) phase samples were in IDLE state. This finding applies only to service classes representing transactions under CICS/ESA Version 4 or later versions of CICS.

Impact: This finding means that conversational transactions were processed in the service class. The presence of these conversational transactions can distort response time calculations and corrupt the analysis performed by CPExpert.

Logic flow: The following rules cause this rule to be invoked:

Rule WLM104: Subsystem Service Class did not achieve average response goal

Rule WLM105: Subsystem Service Class did not achieve percentile response goal

Discussion: CICS/ESA Version 4.1 (or later versions) reports two separate views of the transactions: the *begin_to_end phase* and the *execution phase*[1].

- **Begin_to_end phase**. The begin_to_end phase starts when CICS has classified the transaction[2]. This action normally is done in a CICS Terminal Owning Region (TOR).

- **Execution phase**. The execution phase starts when either CICS or IMS (Version 5 or later) has started an application task to process the transaction. For CICS, this normally is done in a CICS Application Owning Region (AOR). For IMS, this is done in an IMS Message Processing Region (MPR).

CICS provides the System Resources Manager (SRM) with information about the phase (begin_to_end or execution) of transactions by executing the IWMMINIT ("Initialize the Monitoring Environment") macro. The DURATION parameter of the IWMMINIT macro tells the SRM whether the following information related to a transaction is associated with the begin_to_end phase or with the execution phase.

[1]IMS Version 5 reports only *execution phase* samples.

[2]Classifying the transaction into a service class is done by the Workload Manager when the subsystem manager issues the IWMCLSFY macro. Please refer to Section 4 for a more complete discussion of the subsystem work manager (e.g., CICS) interaction with the Workload Manager.

The IWMMINIT macro is issued immediately after CICS has issued the IWMCLSFY ("Assigning Incoming Work Requests to a Service Class") macro to establish a service class for a transaction. Thus, the SRM quickly knows (1) the service class to which a transaction belongs and (2) whether the transaction is in its begin_to_end phase or in its execution phase.

CICS or IMS will provide the SRM with information about the state of the transaction (active state, ready state, waiting state, etc.) by issuing the IWMMCHST ("Change State of Work Request") macro. The SRM simply sets bits in a status word to indicate the state of a transaction.

The SRM periodically samples the status word associated with each transaction[3], and updates counters representing the state of transactions executing in the service class. There is a status word for the begin_to_end phase and a status word for the execution phase, and separate sets of counters are maintained for the various begin_to_end states and execution states for each service class

One of the states reported by CICS is the IDLE state. The idle state indicates that there were no work requests (e.g., CICS transactions) ready to run in the service class. When the IDLE state is reported for the begin_to_end phase, the IDLE state means that the CICS transaction is waiting on the results from a terminal (that is, a conversational transaction is waiting on a response from a terminal operator).

The service class being analyzed by CPExpert exceeded its performance goal (as reported by Rule WLM104 or Rule WLM105). However, the response for the transaction includes the time the terminal operator takes to formulate and enter a response. Unfortunately, this response time is included in the calculation of system response (the transaction is still active, but it is dependent upon a terminal operator response).

Terminal operator response time normally is unpredictable and the time can be quite lengthy, especially when compared with the normal system response time. The terminal operator response time should not be included in the calculation of a performance goal, since the Workload Manager cannot manage system resources to meet the performance goal of the service class when response time is a function of delays caused by a terminal operator.

CPExpert produces Rule WLM111 when the IDLE samples account for more than 25% of the number of begin_to_end samples AND when you have directed CPExpert to analyze response delays based on the

[3]With MVS/ESA SP5.1, the SRM takes its samples every 250 milliseconds.

begin_to_end phase[4]. Since CPExpert is analyzing response delays based on begin_to_end phase samples, Rule WLM111 advises you that the analysis is significantly corrupted by the large number of IDLE samples.

The following example illustrates the output from Rule WLM111:

```
RULE WLM111:  BTE PHASE IDLE SAMPLE COUNT IS LARGE

  CPExpert has detected that the BEGIN_TO_END PHASE Idle samples recorded

  for the CICUSRTX Service Class is quite large.  This means that there were
  conversational transactions executing in the | Service Class, and these
  conversational transactions distort the response times.  Please refer to
  the WLM Component User Manual for a discussion of the implications of this
  finding.

                                BEGIN TO END          IDLE        %  IDLE
  MEASUREMENT INTERVAL          PHASE SAMPLES       SAMPLES      SAMPLES
   13:22-13:27,21JUN1994            4,906           2,302         47.9
```

Suggestion: CPExpert suggests that you consider the following alternatives:

- Identify the conversational transactions and remove them for the service class identified by Rule WLM111. Since the CICS transactions are conversational, it makes no sense to have the transactions in a service class with an interactive response goal.

  IBM suggests the following guidance for CICS transactions:

  - Do not mix CICS-supplied transactions with user transactions
  - Do not mix routed with non-routed transactions.
  - Do not mix conversational with pseudo-conversational transactions
  - Do not mix long-running and short-running transactions.

- Change the guidance to CPExpert such that CPExpert analyzes delays in the execution phase of the transactions. This is done by specifying **%LET PHASE=EXECUTION;** in USOURCE(WLMGUIDE). With this specification, CPExpert will analyze delays in the execution phase and will mostly ignore the begin_to_end phase. The begin_to_end phase samples are relatively meaningless for this service class since such a

[4]That is, you had specified **%LET PHASE=BEGIN_TO_END** in USOURCE(WLMGUIDE).

large amount of response time was spent in IDLE state waiting on a conversation.

Reference: CICS/ESA Version 4.1 Performance Guide
Section 2.6.3.1: Service Definitions

CICS/TS Release 1.1 Performance Guide
Section 2.6.3.1: Service Definitions

CICS/TS Release 1.2 Performance Guide
Section 2.6.3.1: Service Definitions

CICS/TS Release 1.3 Performance Guide
Section 2.5.7.1: Service Definitions

CICS/TS for z/OS Release 2.1 *Performance Guide*: Chapter 8 (Managing Workloads - Setting up service definitions).

CICS/TS for z/OS Release 2.2 *Performance Guide*: Chapter 8 (Managing Workloads - Setting up service definitions).

